

What is claimed is:

- 1 A base-station cell design method adapted so that, in cell designing base-station installment in a mobile communication system, a plurality of base-station candidate locations are given within a service area to locate base station in anyone of these base-station candidate locations, said base-station cell design method comprising the steps of:
 - 10 an objective-function calculation step of calculating a predetermined objective-function responding to a traffic absorption quantity and (or) a communication quality value of said base-station candidate locations; and a base-station layout decision step of deciding a layout at which the base station is installed responding to this objective-function.
 - 15
- 2 The base-station cell design method according to claim 1, said base-station cell design method characterized in being adapted so that:
 - 20 in said objective-function calculation step, the higher said quantity and (or) quality are, the higher objective-function is given; and in said base-station layout decision step, a location of which said objective-function is highest is decided.
 - 25

3 The base-station cell design method according to
claim 1, said base-station cell design method
characterized in that said objective-function is given as
5 a function of the base-station candidate location, the
channel, a kind of antennas to be used, and its
installment direction.

4 The base-station cell design method according to
10 claim 1, said base-station cell design method
characterized in being adapted so that said objective-
function calculation steps are performed in parallel.

5 A base-station cell design method adapted so that, in
15 cell designing in a mobile communication system, a
plurality of base-station candidate locations are given
within a service area to decide anyone of these base-
station candidate locations as a base-station layout while
a radio-wave propagation characteristic estimation
20 technique is used, said base-station cell design method
comprising the steps of:

 as a radio-wave propagation characteristic estimation
technique within said service area with each of said base-
station candidate locations taken as a transmission point,
25 using a first radio-wave propagation characteristic

estimation technique having a first precision; and
as a radio-wave propagation characteristic estimation
technique within said service area with a base-station
location after a case where said base station was decided
5 taken as a transmission point, using a second radio-wave
propagation characteristic estimation technique having a
precision higher than said first precision.

6 The base-station cell design method according to
10 claim 5, said base-station cell design method
characterized in:

as said first radio-wave propagation characteristic
estimation technique, employing a technique that an
electric power attenuates in proportional to an
15 exponential power of a distance; and

as said second radio-wave propagation characteristic
estimation technique, employing a ray tracing technique.

7 A base-station cell design method in a mobile
20 communication system, wherein a service area, and a
traffic density distribution within this service area are
given to locate base stations within the above service
area, said base-station cell design method characterized
in including a base-station layout decision step of
25 sequentially deciding until traffic coverage ratio exceeds

desired traffic coverage ratio and said traffic coverage ratio is defined as a rate of a total traffic quantity absorbed by the base stations to all the traffic quantity that occurs within said service area.

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8 The base-station cell design method according to claim 7, said base-station cell design method characterized in that said base-station layout decision step comprises:

10 a step of calculating a traffic absorption quantity and (or) a communication quality value in each of candidate locations of said base station;

15 an objective-function calculation step of calculating a predetermined objective-function responding to the quantity and (or) the value that are thus calculated result; and

a step of selecting a layout at which the base station is installed responding to this objective-function.

20 **9** The base-station cell design method according to claim 8, said base-station cell design method characterized in being adapted so that:

25 in said objective-function calculation step, the higher said quantity and (or) quality are, the higher objective-function is given; and

in said step of selecting the layout at which the base station is located, the base station is located in the location of which said objective-function is highest.

5 **10** The base-station cell design method according to claim 9, said base-station cell design method characterized in being adapted so that:

a first radio-wave propagation characteristic estimation technique having a first estimation precision 10 is employed for estimating a radio-wave propagation characteristic within said service area for the candidate location of base station taken as a transmission point; and

a second radio-wave propagation characteristic estimation technique having an estimation precision higher 15 than said first estimation precision is employed for estimating a radio-wave propagation characteristic within said service area for the decided location of base station taken as a transmission point.

20 **11** The base-station cell design method according to claim 10, said base-station cell design method characterized in further including a deletion step of sequentially deleting said base stations which was decided 25 until said traffic coverage ratio R_c satisfies a desired

traffic coverage ratio R_{th} .

12 The base-station cell design method according to
claim 11, said base-station cell design method
5 characterized in, in said deletion step, calculating a
modified traffic coverage ratio R_m without each of the
located base stations to find the base station of which a
difference between this R_m and said traffic coverage ratio
 R_c becomes minimum, and in the case that the modified
10 traffic coverage ratio R_m in a case where this base
station was deleted satisfies said R_{th} , to delete the
above base station.

13 The base-station cell design method according to
15 claim 11, said base-station cell design method
characterized in, in said deletion step, calculating said
objective-function in a case where each of the base
stations was deleted, with the base station without which
the above objective-function becomes maximum at the time
20 that it was deleted taken as a candidate for deletion, to
find a modified traffic coverage ratio R_m in a case where
this candidate for deletion was deleted, and in the case
that this R_m satisfies said R_{th} , to delete said candidate
for deletion.

14 The base-station cell design method according to
claim 10, said base-station cell design method
characterized in:

setting a covered area shape to be computed by said
5 first radio-wave propagation characteristic estimation
technique, or a fixed shape as an area shape that an bases
station candidate covers; and

setting a covered area shape to be computed with an
estimation result estimated and stored by said second
10 radio-wave propagation characteristic estimation technique
as an area shape that the located base station.

15 The base-station cell design method according to
claim 14, said base-station cell design method
15 characterized in that, an covered area shape for located
base station and candidate base station is set based on
the area where each observation point within area received
desired quality signals and selects a belonging base
station with the observation point receives the highest
20 received quality and power of all base stations.

16 The base-station cell design method according to
claim 14, said base-station cell design method
characterized in that,
25 an covered area shape for located base station and

candidate base station is set based on the area where total traffic quality is below the traffic capacity of the base station as an area shape that said base station for which installment was decided and said base-station candidate cover respectively, is set an area such that a total of the traffic quantity within the above area falls below the traffic quantity that the base station can accommodate.

10 **17** The base-station cell design method according to claim 10, said base-station cell design method characterized in, by taking into consideration a transmitted electric power of said base station for which installment was decided, and a determination threshold as well in a received demodulation processing in the above base station, in addition to the estimation result estimated by said second radio-wave propagation characteristic estimation technique, deciding said area shape.

20 **18** The base-station cell design method according to claim 10, said base-station cell design method characterized in being adapted so that, in allocating a channel to said base station for which installment was decided within said service area, said objective-function

is calculated for all channels with a radio-wave propagation characteristic estimated by said second radio-wave propagation characteristic estimation technique to allocate the channel of which the objective-function
5 becomes maximum.

19 The base-station cell design method according to claim 8, said base-station cell design method characterized in, as said traffic absorption quantity,
10 employing a traffic quantity that occurs within an area to be covered by a base-station candidate to be computed by said traffic density distribution, or a rate of this traffic quantity to a total traffic quantity that occurs within said service area.

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20 The base-station cell design method according to claim 8, said base-station cell design method characterized in, as said traffic absorption quantity, employing a traffic quantity that occurs within the area
20 other than the area covered by the base station for which installment was decided, out of the areas to be covered by the base-station candidate to be computed by said traffic density distribution, or a ratio of this traffic quantity to a total traffic quantity that occurs within said
25 service area.

21 The base-station cell design method according to
claim 8, said base-station cell design method
characterized in, as said traffic absorption quantity,
5 employing a total traffic quantity that occurs in all the
area to be covered by the base station for which
installment was decided and the base-station candidate, or
a ratio of this total traffic quantity to a total traffic
quantity that occurs within said service area.

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22 The base-station cell design method according to
claim 8, said base-station cell design method
characterized in that, as said quality value, are given a
desired received signal power/(an undesired received
15 signal power + a noise signal power), the desired received
signal power/the undesired received signal power, a bit
error ratio, a frame error ration.

23 The base-station cell design method according to
20 claim 8, said base-station cell design method
characterized in:

as said quality value, employing a sum total of
interference quantities from the base stations for which
installment was decided, said interference quantity being
25 observed in the base-station candidate location;

in computing the interference quantity from the already-installed base station, employing a propagation-loss estimation result computed and stored by said second radio-wave propagation characteristic estimation

5 technique; and

deciding said quality value so that the smaller the sum total of said interference quantity is, the higher the quality value becomes.

10 **24** The base-station cell design method according to claim 8, said base-station cell design method characterized in, as said quality value, employing an average of a ratio of a desired-signal electric power: an undesired-signal electric power that a terminal within the 15 area that the additional base-station candidate covers observes to exclude a location within the above covered area in which no traffic occurs in averaging it.

20 **25** The base-station cell design method according to claim 8, said base-station cell design method characterized in, as said quality value, employing an average of a ratio of a desired-signal electric power: an undesired-signal electric power that a terminal observes within the entire region of the service area to exclude a 25 location in which no traffic occurs within the above

covered area in averaging it.

26 The base-station cell design method according to
claim 8, said base-station cell design method
5 characterized in, as said quality value, employing a rate,
which satisfies a desired ratio of a desired-signal
electric power: an undesired-signal electric power, out of
ratios of the desired-signal electric power: the
undesired-signal electric power that a terminal observes
10 in the entire service area.

27 The base-station cell design method according to
claim 8, said base-station cell design method
characterized in assuming a transmitted power of the base
15 station for which installment was decided or the base-
station candidate to be a fixed value, said transmitted
power being referred to in computing said quality value.

28 The base-station cell design method according to
20 claim 8, said base-station cell design method
characterized in deciding a transmitted power of the base
station for which installment was decided or the base-
station candidate with the traffic quantity to be absorbed
by the above base station, said transmitted power being
25 referred to in computing said quality value.

29 The base-station cell design method according to
claim 8, said base-station cell design method
characterized in:

5 as said first radio-wave propagation characteristic
estimation technique, employing a technique that an
electric power attenuates in proportional to an
exponential power of a distance; and

10 as said second radio-wave propagation characteristic
estimation technique, employing a ray tracing technique.

30 The base-station cell design method according to one
of claim 7, said base-station cell design method
characterized in that no location within the service area
15 in which no traffic occurs is included in said candidate
location.

31 The base-station cell design method according to
claim 7, said base-station cell design method
20 characterized in that no location in which the base
station is physically impossible to arrange is included in
said candidate location.

32 The base-station cell design method according to
25 claim 10, said base-station cell design method

characterized in that said candidate location is seasoned with information relating to a direction of the base station as well for decision.

5 **33** The base-station cell design method according to
claim 10, said base-station cell design method
characterized in, in the event that said candidate
location was pre-given a priority, as said objective-
function, using a new objective-function having the above
10 priority considered for this objective-function.

34 The base-station cell design method according to
claim 10, said base-station cell design method
characterized in being adapted so that said objective-
15 function is varied in the event that said objective-
function has an identical value in the different candidate
locations or channels as well.

35 The base-station cell design method according to
20 claim 7, said base-station cell design method
characterized in:

 with regard to a first service area, executing said
base-station layout decision step; and
 afterward, with regard to a second service area that
25 is partially overlapped with said first service area,

executing said base-station installment step for the base-station candidate location other than the base station for which installment was decided in said first service area.

5 **36** The base-station cell design method according to
claim 8, said base-station cell design method
characterized in that said objective-function is given as
a function of the base-station candidate location, the
channel, a kind of antennas to be used, and its
10 installment direction.

15 **37** The base-station cell design method according to
claim 8, said base-station cell design method
characterized in being adapted so that said objective-
function calculation steps are performed in parallel.

20 **38** A base-station cell design apparatus adapted so that,
in designing a base-station installment in a mobile
communication system, a plurality of base-station
candidate locations are given within a service area to
install a base station in anyone of these base-station
candidate locations, said base-station cell design
apparatus characterized in including:

25 objective-function calculation means for calculating a
predetermined objective-function responding to a traffic

absorption quantity and/or a communication quality value
in each of said base-station candidate locations; and
base-station layout decision means for deciding a
layout at which the base station is installed responding
5 to this objective-function.

39 The base-station cell design apparatus according to
claim 38, said base-station cell design apparatus
characterized in that said objective-function is given as
10 a function of the base-station candidate location, the
channel, a kind of antennas to be used, and its
installment direction.

40 A base-station cell design apparatus adapted so that,
15 in designing a base-station installment in a mobile
communication system, a plurality of base-station
candidate locations are given within a service area to
decide anyone of these base-station candidate locations as
a base-station installment layout while a radio-wave
20 propagation characteristic estimation technique is used,
said base-station cell design apparatus characterized in
including the means for:

as a radio-wave propagation characteristic estimation
technique within said service area with each of said base-
25 station candidate locations taken as a transmission point,

using a first radio-wave propagation characteristic estimation technique having a first precision to install said base station; and

as a radio-wave propagation characteristic estimation
5 technique within said service area with a base-station installment location after a case where said base station was installed taken as a transmission point, using a second radio-wave propagation characteristic estimation technique having a precision higher than said first
10 precision.

41 A base-station cell design apparatus in a mobile communication system, wherein a service area, and a traffic density distribution within this service area are
15 given to arrange a base station within the above service area, said base-station cell design apparatus characterized in including base-station layout decision means for, with a rate of a total traffic quantity that can be absorbed by the base station arranged within said
20 service area to all the traffic quantity that occurs within said service area taken as a traffic coverage ratio, sequentially deciding layouts at which the base station is installed until said traffic coverage ratio exceeds a desired traffic coverage ratio.

42 The base-station cell design apparatus according to
claim 41, said base-station cell design apparatus
characterized in further including deletion base-station
decision means for sequentially deleting said base
5 stations for which installment was decided until said
traffic coverage ratio satisfies a desired traffic
coverage ratio.

43 A computer-readable program for causing a computer
10 to execute a base-station cell design method adapted so
that, in designing a base-station installment in a mobile
communication system, a plurality of base-station
candidate locations are given within a service area to
install a base station in anyone of these base-station
15 candidate locations, said program characterized in
comprising:

 an objective-function calculation step of calculating
 a predetermined objective-function responding to a traffic
 absorption quantity and (or) a communication quality value
20 in each of said base-station candidate locations; and
 a base-station layout decision step for deciding a
 layout at which the base station is installed responding
 to this objective-function.

25 **44** The program according to claim 43, said program

characterized in being adapted so that:

in said objective-function calculation step, the higher said quantity and (or) value are, the higher objective-function is given; and

5 in said base-station layout decision step, the location of which said objective-function is highest is decided.

45 The program according to claim 43, said program
10 characterized in that said objective-function is given as a function of the base-station candidate location, the channel, a kind of antennas to be used, and its installment direction.

15 46 The program according to claim 43, said program characterized in being adapted so that said objective-function calculation steps are performed in parallel.

47 A computer-readable program for causing a computer
20 to execute a base-station cell design method adapted so that, in designing a base-station installment in a mobile communication system, a plurality of base-station candidate locations are given within a service area to decide anyone of these base-station candidate locations as
25 a base-station installment layout while a radio-wave

propagation characteristic estimation technique is used,
said program characterized in comprising the steps of:

as a radio-wave propagation characteristic estimation
technique within said service area with each of said base-
5 station candidate locations taken as a transmission point,
using a first radio-wave propagation characteristic
estimation technique having a first precision to
additionally install said base station; and

as a radio-wave propagation characteristic estimation
10 technique within said service area with said base-station
additional-installment location after a case where said
base station was installed taken as a transmission point,
using a second radio-wave propagation characteristic
estimation technique having a precision higher than said
15 first precision.

48 A computer-readable program for causing a computer
to execute a base-station cell design method in a mobile
communication system, wherein a service area, and a
20 traffic density distribution within this service area are
given to arrange a base station within the above service
area, said program characterized in including a base-
station layout decision step of, with a rate of a total
traffic quantity that can be absorbed by the base stations
25 arranged within said service area to all traffic quantity

that occurs within said service area taken as a traffic coverage ratio, sequentially deciding layouts at which the base station is installed until said traffic coverage ratio exceeds a desired traffic coverage ratio.

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49 The program according to claim 48, said program characterized in that said base-station layout decision step including:

a step of calculating a traffic absorption quantity
10 and (or) a communication quality value in each of said base-station candidate locations;

an objective-function calculation step of calculating a predetermined objective-function responding to the quantity and (or) the value that are thus calculated
15 result; and

a step of selecting the layout at which the base station is installed responding to this objective-function.

50 The program according to claim 49, said program
20 characterized in being adapted so that:

in said objective-function calculation step, the higher said quantity and (or) value are, the higher objective-function is given; and

in said step of selecting the layout at which the base
25 station is installed, the location of which said

objective-function is highest is decided.

51 The program according to claim 50, said program characterized in being adapted so that:

5 a first radio-wave propagation characteristic estimation technique having a first estimation precision is employed for estimating a radio-wave propagation characteristic within said service area with the candidate location in which said base station is installed taken as
10 a transmission point; and

a second radio-wave propagation characteristic estimation technique having an estimation precision higher than said first estimation precision is employed for estimating a radio-wave propagation characteristic within
15 said service area with the above base station after a case where said base station was installed taken as a transmission point.

52 The program according to claim 51, said program
20 characterized in further including a deletion step of sequentially deleting said base stations for which installment was decided until said traffic coverage ratio satisfies a desired traffic coverage ratio.

25 **53** The program according to claim 52, said program

characterized in, in said deletion step, finding a modified traffic coverage ratio R_m in a case where each of base stations for which installment was decided was deleted to find the base station of which a difference 5 between this R_m and said traffic coverage ratio R_c becomes minimum, and in the event that the modified traffic coverage ratio R_m in a case where this base station was deleted satisfies said R_{th} , to delete the above base station.

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54 The program according to claim 52, said program characterized in, in said deletion step, calculating said objective-function in a case where each of base stations for which installment was decided was deleted, with the 15 base station of which the above objective-function becomes maximum at the time that it was deleted taken as a candidate for deletion, to find a modified traffic coverage ratio R_m in a case where this candidate for deletion was deleted, and in the event that this R_m 20 satisfies said R_{th} , to delete said base station.

55 The program according to claim 51, said program characterized in:
as an area shape that an additional base-station
25 candidate covers, setting a shape to be computed by said

first radio-wave propagation characteristic estimation technique, or a fixed shape, and

as an area shape that the base station for which
installment was decided covers, setting a shape to be
5 computed with an estimation result estimated and stored by
said second radio-wave propagation characteristic
estimation technique.

56 The program according to claim 55, said program
10 characterized in that, as an area shape that the base
station for which installment was decided and said base-
station candidate cover respectively, is set an area such
that a connection to the base station, which satisfies a
desired received quality within each covered area, and yet
15 of which a received quality or a received electric power
is highest becomes possible.

57 The program according to claim 56, said program
characterized in that, as an area shape that the base
20 station for which installment was decided, and said base-
station candidate cover respectively, is set an area such
that a total of the traffic quantity within the above area
falls below the traffic quantity that the base station can
accommodate.

58 The program according to claim 52, said program characterized in, in addition to the estimation result estimated by said second radio-wave propagation characteristic estimation technique, by taking into
5 consideration a transmitted electric power of said base station for which installment was decided, and a determination threshold in a received demodulation processing in the above base station as well, deciding said area shape.

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59 The program according to claim 52, said program characterized in being adapted so that, in allocating a channel to said base station for which installment was decided within said service area, said objective-function
15 is calculated for all channels with a radio-wave propagation characteristic estimated by said second radio-wave propagation characteristic estimation technique to allocate a channel of which the objective-function becomes maximum hereto.

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60 The program according to claim 55, said program characterized in, as said traffic absorption quantity, employing a traffic quantity that occurs within the area to be covered by the base-station candidate to be
25 calculated by said traffic density distribution, or a rate

of this traffic quantity to a total traffic quantity that occurs within said service area.

61 The program according to claim 55, said program
5 characterized in, as said traffic absorption quantity,
employing a traffic quantity that occurs in the area other
than the area covered by the base station for which
installment was decided, out of the areas to be covered by
the base-station candidate to be computed by said traffic
10 density distribution, or a rate of this traffic quantity
to a total traffic quantity that occurs within said
service area.

62 The program according to claim 55, said program
15 characterized in, as said traffic absorption quantity,
employing a total traffic quantity that occurs in all the
area to be covered by the additional base station for
which installment was decided, and the base-station
candidate, or a rate of this total traffic quantity to a
20 total traffic quantity that occurs within said service
area.

63 The program according to claim 55, said program
characterized in that, as said quality value, are given a
25 desired received signal power/(a undesired received signal

power + a noise signal power), the desired received signal power/the undesired received signal power, a bit error ratio, a frame error ration.

5 **64** The program according to claim 55, said program characterized in: as said quality value, employing a sum total of interference quantities from the base station for which installment was decided, said interference quantity being observed in the base-station candidate location;

10 in computing the interference quantity from the already-installed base station, employing a propagation-loss estimation result computed and stored by said second radio-wave propagation characteristic estimation technique; and

15 deciding said quality value so that the smaller said sum total of said interference quantity is, the higher the quality value becomes.

20 **65** The program according to one of claim 55, said program characterized in, as said quality value, employing an average of a ratio of a desired-signal electric power: an undesired-signal electric power that a terminal within the area that the additional base-station candidate covers observes to exclude a location within the above covered area in which no traffic occurs in averaging it.

66 The program according to claim 55, said program
characterized in, as said quality value, employing an
average of a ratio of a desired-signal electric power: an
5 undesired-signal electric power that a terminal observes
within the entire service area to exclude a location
within the above service area in which no traffic occurs
in averaging it.

10 67 The program according to claim 55, said program
characterized in, as said quality value, employing a rate
that satisfies a desired ratio of a desired-signal
electric power: an undesired-signal electric power, out of
the ratios of the desired-signal electric power: the
15 undesired-signal electric power that a terminal observes
in the entire service area.

68 The program according to claim 64, said program
characterized in assuming a transmitted power of the base
20 station for which installment was decided, or the base-
station candidate to be a fixed value, said transmitted
power being referred to in computing said quality value.

69 The program according to claim 64, said program
25 characterized in deciding a transmitted power of the base

station for which installment was decided, or the base-station candidate with the traffic quantity to be absorbed by the above base station, said transmitted power being referred to in computing said quality value.

5

70 The program according to claim 47, said program characterized in:

as said first radio-wave propagation characteristic estimation technique, employing a technique that an electric power attenuates in proportional to an exponential power of a distance; and

as said second radio-wave propagation characteristic estimation technique, employing a ray tracing technique.

15 **71** The program according to claim 48, said program characterized in:

as said first radio-wave propagation characteristic estimation technique, employing a technique that an electric power attenuates in proportional to an exponential power of a distance; and

as said second radio-wave propagation characteristic estimation technique, employing a ray tracing technique.

25 **72** The program according to claim 48, said program characterized in that no location within the service area

in which no traffic occurs is included in said candidate location.

73 The program according to claim 48, said program
5 characterized in that no location in which the base station is physically impossible to arrange is included in said candidate location.

74 The program according to claim 48, said program
10 characterized in that said candidate location is seasoned with information relating to a direction of the base station as well for setting.

75 The program according to claim 48, said program
15 characterized in, in the event that said candidate location was pre-given priority, as said objective-function, using a new objective-function having the above priority considered for this objective-function.

20 **76** The program according to claim 50, said program characterized in being adapted so that said objective-function is varied in the event that said objective-function has an identical value in different candidate locations or channels as well.

77 The program according to claim 48, said program characterized in:

with regard to a first service area, executing said base-station layout decision step; and

5 afterward, with regard to a second service area that is partially overlapped with said first service area, executing the above base-station layout decision step for the base-station candidate location other than the base station candidate location for which installment was
10 decided in said first service area.

78 The program according to claim 49, said program characterized in that said objective-function is given as a function of the base-station candidate location, the
15 channel, a kind of antennas to be used, and its installment direction.

79 The program according to claim 49, said program characterized in being adapted so that said objective-
20 function calculation steps are performed in parallel.

80 A base-station design method in a mobile communication system, said base-station design method characterized in including:

25 a step of giving a plurality of base-station candidate

- locations within a service area; and
an objective-function calculation step of, with a predetermined objective-function, calculating at least one of a traffic absorption quantity and a communication quality value in a case where a base station was installed in anyone of said base-station candidate locations.
- 81** A base-station cell design method in a mobile communication system, said base-station cell design method characterized in including:
a base-station candidate location setting step of giving a plurality of base-station candidate locations within a service area;
an objective-function calculation step of, with a predetermined objective-function, calculating at least one of a traffic absorption quantity and a communication quality value in a case where a base station was installed in each of said base-station candidate locations; and
a step of employing a result of the objective-function calculated in said objective-function calculation step to decide a base-station installment location within said service area.
- 82** A base-station cell design method of, in designing a base-station installment in a mobile communication system,

designing parameters to be set for base stations given in plural within a service area, said base-station cell design method characterized in including:

- an objective-function calculation step of calculating
- 5 a predetermined objective-function responding to a traffic absorption quantity and (or) a communication quality value in each of said base stations; and
- a base-station parameter decision step of deciding parameters for installing the base station responding to
- 10 this objective-function.

83 A base-station cell design apparatus for, in designing a base-station installment in a mobile communication system, designing parameters to be set for base station given in plural within a service area, said base-station cell design apparatus characterized in including:

- objective-function calculation means for calculating a predetermined objective-function responding to a traffic absorption quantity and (or) a communication quality value in each of said base stations; and
- 20 base-station parameter decision means for deciding parameters for installing the base station responding to this objective-function.

84 A computer-readable program for causing a computer to execute a base-station cell design method of, in designing a base-station installment in a mobile communication system, designing parameters to be set for 5 base station given in plural within a service area, said program characterized in including:

an objective-function calculation step of calculating a predetermined objective-function responding to a traffic absorption quantity and (or) a communication quality value 10 in each of said base stations; and

a base-station parameter decision step of deciding parameters for installing the base station responding to this objective-function.